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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/995,433	11/27/2001	Donald Ray Bloyer	1834.135US1	9787

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EXAMINER
MILLER, PATRICK L

ART UNIT	PAPER NUMBER
2837	

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/995,433

Applicant(s)

BLOYER ET AL.

Examiner

Patrick Miller

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 October 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 7-12, 16, 23, 24 and 28-32 is/are rejected.
- 7) ☒ Claim(s) 4-6, 13-15, 17-22 and 25-27 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed on have been fully considered but they are not persuasive.

- With respect to the Kim et al (6,493,173) reference and claims 1 and 2, the arguments merely state that Kim et al do not disclose the features of claim 1, and do not distinguish the Kim et al reference from the recited limitations. Kim et al disclose that repeatable runout (RRO) is a disturbance due to eccentricities and other distortions in a track recorded on a disc (col. 1, ll. 24-26). Here, RRO is determined to be the interference between the interface between the disk surface and the head, since the head reads these interferences. Furthermore, in response to an RRO at a certain track, a RRO compensation value is used in the feedback path to modulate current to the voice coil motor (VCM) in response to a predicted RRO value (Fig. 2B, #42 to VCM; see also col. 3, ll. 32-37). Therefore, Kim et al do disclose every feature of claims 1 and 2. With respect to claim 16, Kim et al do not disclose modulating current to control the disc in reference to the interference.
- With respect to the Houston et al (6,282,046) reference and claims 12 and 28, the arguments state that Houston et al do not disclose the sampling intervals are related to the servo controller and being operative to update the spindle command signal (p. 9, last paragraph). Claims 12 and 28 do not recite this limitation, and therefore, Houston et al do disclose the recited limitations. See the 102(e) rejection below.

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- With respect to the Dunn et al (5,473,230) reference and claims 1, 16, 23, and 29, the arguments are unpersuasive (p. 10, beginning at the first full paragraph). See 103(a) rejection below.
- With respect to the Boyd et al (6,741,414) reference and claims 1, 16, 23, and 29, the arguments are unpersuasive (p. 11, beginning at the third full paragraph). See 103(a) rejection below.

Claim Objections

2. Claims 5 and 6 are objected to because of the following informalities: see bullet(s) below.

Appropriate correction is required.

- In claim 5, change “a head and a disc” (l. 5) to “the head and the disc.”
- Claim 5 recites, “the mass storage device” (ll. 4 and 5). Initially cited as a storage device in Claim 3. Make consistent.
- Claim 6 recites, “the mass storage device” (ll. 6 and 7). Initially cited as a storage device in Claim 3. Make consistent.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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3. Claims 1, 2, 31, and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Kim et al (6,493,173).

- Kim et al disclose a method comprising the steps of: directing current to a motor (fig. 2B, #42), and modulating the current, in reference to an occurrence of interference in an interface between a head and a surface (fig. 2B #64; col. 3, lines 5-37; col. 7, lines 31-44).
- With respect to claim 2, the modulating step further comprises modulating the current in reference to a predetermined profile (fig. 2B, profile stored in sectors, #28A and in #52).
- With respect to claim 31, the RRO is expected (col. 3, ll. 5-15, 21-37).
- With respect to claim 32, RRO means that the head contacts the disc or “crashes” (col. 1, ll. 24-27).

4. Claims 12 and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Houston et al (6,282,046).

- Houston et al disclose an apparatus and method for generating a profile of modulated current of a spindle motor of a mass storage device, the apparatus and method comprising: a receiver that receives performance data of the mass storage device (Fig. 1, #50), the data including the quantity of current applied to the spindle motor at a plurality of discrete points in time (col. 3, lines 19-27; during each servo sampling interval (discrete points in time) updating the current to the spindle motor), and including at least one performance measurement (servo parameters and spindle motor current), a determiner that determines a portion of the performance data that indicates a performance inadequacy that exceeds a predetermined threshold (col. 3, lines 30-52; when actuator

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current exceeds a predetermined threshold); and a generator that generates the profile in reference to the performance inadequacy and the performance data (col. 6, lines 17-47; actuator current profile).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3, 11, 16, 23, 24, 29, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dunn et al (5,473,230).

- With respect to claim 1, Dunn et al disclose a method comprising the steps of directing current to a motor (fig. 1, #17 provides current to #18), and modulating the current in reference to interference between a head and a surface (cols. ¾, lines 63-67/1-26),
- Dunn et al do not explicitly disclose the drag occurring between the head and a surface; however, it would be obvious to a person of ordinary skill in the art at the time of the invention that the air circulating around the disk creates the interference (drag) between the head and a surface. That is to say, the air would circulate around the disk head, including the gap between the head and the disk surface, thereby creating an interference between the head and the disk surface.
- With respect to claim 2, the modulating step modulates the current in reference to a predetermined profile (col. 4, lines 28-34; table).

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- With respect to claim 3, the motor is associated with a spindle and the surface is a disc, wherein the disc and motor are part of a storage device (col. 2, lines 64-66).
- With respect to claims 11 and 30, the torque correction means of Dunn et al increments the current supplied to the current, and therefore increasing the current (col. 2, lines 29-36).
- With respect to claim 16, Dunn et al disclose a method for dynamically modulating current based on dynamic performance during operation of a storage device, the method comprising: determining interference between a head and a storage medium in reference to a performance profile (col. 2, lines 29-33; current profile is stored in a look-up table), and in reference to dynamic performance during operation (fig. 1, dynamic performance is the velocity error); and modulating current to the disc in reference to said interference (col. 2, lines 34-41).
- With respect to claim 23, Dunn et al disclose an apparatus for controlling a spindle motor of a mass storage device, the apparatus comprising: a recording medium (col. 2, line 8; disk), a spindle motor attached to the recording medium (col. 2, line 4; spindle motor), a modulator that is coupled to the motor and modulates current to the motor to avoid anomalies, where avoid is interpreted as to “keep from happening.” I.e., the control circuitry modulates current to the motor to keep the drag effects from impairing system operation.
- With respect to claim 24, the predetermined profile can also be based on a plurality of times (col. 5, lines 40-52).

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- With respect to claim 29, Dunn et al disclose an information handling system to control a spindle motor of a mass storage device comprising: a rotatable recording medium (col. 2, line 8; disk), a spindle motor (col. 2, line 4; spindle motor), a processor (fig. 1, circuitry), a head (col. 2, line 9), and a means to modulate the current to the motor so that interferences between the head and recording medium are reduced (cols. 3/4, lines 63-67/1-26).
6. Claims 1-3, 7-10, 16, 23, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boyd et al (6,741,414).
- With respect to claims 1, 16, 23, and 29, Boyd et al disclose a method comprising the steps of controlling the speed of a spindle motor in reference to an occurrence of interference/anomalies to a rotating media storage system (Cols. 11/12/13, lines 54-67/1-67/1-14, respectively).
 - Boyd et al do not explicitly disclose modulating the current to control the speed of the spindle motor and the interference occurring between a head and a surface. However, it would have been obvious to one having ordinary skill in the art at the time of the invention that to increase or decrease the speed of the spindle motor, and consequently the speed of the rotating storage medium, Boyd et al would increase or decrease the current supplied to the spindle motor. Additionally, Boyd et al discloses controlling the spindle motor speed when mechanical resonances occur. It would be obvious to one having ordinary skill in the art at the time of the invention that mechanical resonances would include viscous drag (col. 12, lines 54-64) and resonances between the head and disk. Finally, it would be obvious to a person of ordinary skill in the art at the time of the

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invention that controlling a spindle motor based on mechanical resonances would reduce the wear on the head and the recording medium.

- With respect to claim 2, Boyd et al disclose controlling the speed of the spindle motor (modulating current) in reference to a predetermined profile (col. 13, lines 11-14).
- With respect to claim 3, Boyd et al disclose the motor being associated with a spindle and the surface is a disc, wherein the disc and motor are included in a storage device (fig. 2, #235, #220).
- With respect to claims 7 and 8, Boyd et al disclose controlling the speed of the spindle motor (modulating current) based on a predetermined profile (col. 12, line 27; optimal trajectories based on a parameterized table; col. 13, lines 11-14), wherein the optimized trajectory reduces take-off air-bearing instability (cols. 12/13, lines 25-67/1-14), where it would have been obvious to a person of ordinary skill in the art at the time of the invention that mechanical resonances would include head to disk interference or air-bearing instability.
- With respect to claims 9 and 10, Boyd et al disclose controlling the speed of the spindle motor (modulating current) during spin-up and spin-down of the mass storage device (cols. 12/13, lines 25-67/1-14).

Allowable Subject Matter

7. Claims 4-6, 13-15, 17-22 and 25-27 are objected to as being dependent upon a rejected base claim, but would be allowable if the minor informalities are corrected and rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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- With respect to claims 4 and 25, the Prior Art does not disclose controlling a spindle motor by monitoring a lapse of time, wherein the lapse of time represents the amount of current to modulate the motor when an interface between the head and disc occurs.
- With respect to claim 5, the Prior Art discloses interference thresholds, that once exceeded, current is stopped to the motor. The Prior Art does not disclose modulating current to a spindle motor when an interference threshold has been exceeded.
- With respect to claim 13, the Prior Art discloses signals in storage devices that represent air-bearing stability; however, the Prior Art does not teach controlling a storage device with the limitations of claim 12, wherein the performance measurement comprises air-bearing stability.
- With respect to claim 15, the Prior Art discloses measuring the drag and speed in storage devices; however, the Prior Art does not disclose burning performance data, that includes drag and speed measurements into the firmware of a processor of the mass storage device.
- With respect to claim 17, the Prior Art does not disclose a speed “error” in a storage device, wherein the speed “error” indicates an interference between a head and a storage medium.
- With respect to claim 18, the Prior Art does not disclose a time per revolution “error” in a storage device, wherein the time per revolution “error” indicates an interference between a head and a storage medium.

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- With respect to claim 19, the Prior Art does not disclose in a step to determine and interference between a head and a storage medium, a sub-step of sampling the rate of change of speed and comparing the rate of change of speed to a last sample.

Relevant Art

8. Rahman (2003/0117906) disclose that run-out or RRO can cause the head to contact that disc surface or "crash."

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

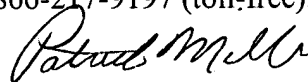
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick Miller whose telephone number is 571-272-2070. The examiner can normally be reached on M-F, 8:30-5:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on 571-272-2800 ext 41. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9318.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-3431.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Patrick Miller
Examiner
Art Unit 2837

pm
January 3, 2005



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